

formed a clearing on one of the seaweed-covered blocks before referred to. In the midst of this clearing was a pedestal of flint rather more than 1 inch in diameter, standing up above the surface of the chalk: it projected so much that a tap from my hammer broke it off. On the top of the smooth fractured surface of this flint the occupant of the clearing had taken up its abode. The shell was closely adapted to the uneven surface, which it would only fit in one position. The cleared surface was in a hollow with several small natural cavities, where the limpet could have found a pit ready made to shelter in; yet it preferred, after each excursion, to climb up on to the top of the flint, the most exposed point in all its domain.

In South America our limpets have, I believe, representatives with shells a foot in diameter. If the proceedings of these South-American giants are at all the same as those of the limpets of our own shores and are in proportion to their size, they must materially aid in the encroachment of the sea on the land when the rock happens to be soft*.

Notes on the Presence of *Tachyglossus* and *Ornithorhynchus* in Northern and North-eastern Queensland. By Capt. WILLIAM E. ARMIT, F.L.S.

[Read June 20, 1878.]

SOME doubt having been evinced of the existence of *Tachyglossus* and *Ornithorhynchus* in Northern Queensland, I am desirous of laying a few facts before the Society, which will establish the extreme northern limit of the species as far as yet known.

Tachyglossus occurs at Bellenden Plains, situated some thirty miles north-east of Cardwell, in about 18° S. latitude. It frequents the scrubs on the mountains and river-banks, and on one occasion, in 1873, I found the hind legs of one in a black fellow's "dilly-bag." At Georgetown, distant some 200 miles west of Cardwell, this animal is pretty common; and last year I succeeded in capturing three males. One adult female I secured in 1876, having a fine young one in the pouch. All the above speci-

* Subsequent to the reading of the foregoing, my attention was called to a paper by Fred. C. Lukis ('Mag. of Nat. Hist.' 1831, vol. iv. p. 346), wherein figures of limpet-tracks are given. Although I find that, independently, I corroborate his observations, nevertheless, so far as I can learn, the bulk of my facts and suggestions have not hitherto been dwelt on by previous writers.

mens were found by mere chance when on Wallaby shooting-excursions in the granitic hills near Georgetown. Had I chosen systematically to hunt for them, I have no doubt that twenty could have been procured in a fortnight; for I have seen their tracks and burrows almost everywhere round this township.

The female is said here to lay one egg, which is placed in the abdominal pouch and hatched*. The young thrusts its bill into the curious inverted nipple and expresses the milk. From observing a young male with softish quills, I am of opinion that it leaves the abdominal pouch as soon as the spines begin to cover its back, as these would no doubt wound the skin lining it. The males have only a thick muscular ring, which in the females expands into a large pouch during the breeding-season. The opening is diagonal, and back towards the hind quarters.

From the fact that I had to use some force to get the young out of the pouch, I think that the inverted nipple is supplied with a muscular ring which is contractile, and by which the animal is enabled to hold the bill firmly in the nipple.

* [Captain Armit would seem not to be conversant with Prof. Owen's researches on the Monotremata, especially his paper "On the Marsupial Pouches, Mammary Glands, and Mammary Fœtus of the *Echidna hystrix*," in 'Philos. Trans.' (Roy. Soc.), 1865, pp. 671-686, pls. xxxix.-xli. In this both curious and highly interesting information are given, not the least being the conflicting evidence of Australian observers. Whether the *Echidna* and *Ornithorhynchus* are brought forth alive or are the product of extruded eggs, is still an unsettled question: the anatomical data point to the former; those who have had the live animal in Australia insist on the latter. It behoves, then, that the further attention of those with opportunity in the field should be called to the desiderata in the life-history of these animals, as summed up by Prof. Owen, *l. c.* p. 682, and herewith quoted:—

"The chief points in the generative economy of the Monotremes which still remain to be determined by actual observation are:—1. The manner of copulation. 2. The season of copulation. 3. The period of gestation. 4. The nature and succession of the temporary structures for the nourishment and respiration of the fœtus prior to birth or exclusion. 5. The size, condition, and powers of the young at the time of birth or exclusion. 6. The period during which the young requires the lacteal nourishment. 7. The age at which the animal attains its full size."

Of the *Echidna*, pregnant females killed between 25th July and 7th August, and of the *Ornithorhynchus*, between 15th October and 15th November, Prof. Owen suggests, might yield material to explain No. 4 as above. The womb and all connected parts intact should be placed in strong spirit and forwarded to London for examination by competent authorities. Eggs, or supposed eggs, as laid, if promptly put in spirit and transmitted hither, would solve a disputed physiological problem of the highest interest.—EDITOR.]

Mr. E. B. Kennedy records the capture of a *Tachyglossus* at Plain Creek, in lat. 21° south. And, from information derived from one of my troopers, I am of opinion that it will be found on the Leichardt ranges, as also throughout the length and breadth of the Cape-York peninsula. The New-Guinea forms will, I think, vary (perhaps only slightly) from our Australian types, judging by Mr. Ramsay's description of *Tachyglossus lawesii* (Proc. Linn. Soc. New S. Wales, 26 March, 1877).

I forward, under separate cover, the head of an adult female killed at Georgetown, for comparison with the New-Guinea and South-Australian types.

I have not, as yet, been able to secure specimens of the *Ornithorhynchus*; but I watched one swimming about in a large water-hole situated 150 miles west of Georgetown on the road to Normanton. I distinctly saw this animal's head and bill above water, but was unable to capture it, as it dived on hearing the pack-horses trotting up to the hole to drink. My boys inform me that they saw this "funny fellow" in the Upper Herbert; and it occurs on the Leichardt river. The extreme northern limit is therefore at present formed by the 18° of south latitude.

The absence of *Tachyglossus* on the Flinders and Gilbert river-plains is easily accounted for by the absence of scrubs and hills, or rocks, under which they generally burrow. It never comes out to feed except during the night: and when attacked, simply rolls itself into a spiny ball. Four men, by taking one claw each, had considerable difficulty in stretching one out. They resemble a hedgehog in outward appearance, but are much darker.

Remarks on the Skull of the *Echidna* from Queensland.

By Dr. J. MURIE, F.L.S.

[Read June 20, 1878.]

ALONG with his paper, Capt. W. E. Armit was good enough to forward to the Society a roughly cleaned dried skull of the *Echidna* obtained by him, to which the following label was attached: "Head of *Tachyglossus (histrix?)* ♀, killed near Georgetown, in 18° S. lat., Nov. 1876." As, moreover, he has expressed a desire that it should be compared with those of South Australia and New Guinea, I have fulfilled this wish so far as circumstances permitted.